

202986

STIC EIC 2100 Search Request Form

Today's Date:

9/26/06

What date would you like to use to limit the search?

Priority Date: 6/28/01

Other:

Name DOHM CHANKONG

AU 2152 Examiner # 80187

Room # 4A40 Phone 2-3942

Serial # 09/893, 829

Format for Search Results (Circle One):

PAPER DISK EMAIL

Where have you searched so far?

USP DWPI EPO JPO ACM IBM TDB

IEEE INSPEC SPI Other Scholar

Is this a "Fast & Focused" Search Request? (Circle One) YES NO

A "Fast & Focused" Search is completed in 2-3 hours (maximum). The search must be on a very specific topic and meet certain criteria. The criteria are posted in EIC2100 and on the EIC2100 NPL Web Page at <http://ptoweb/patents/stic/stic-tc2100.htm>.

What is the topic, novelty, motivation, utility, or other specific details defining the desired focus of this search? Please include the concepts, synonyms, keywords, acronyms, definitions, strategies, and anything else that helps to describe the topic. Please attach a copy of the abstract, background, brief summary, pertinent claims and any citations of relevant art you have found.

Is this request for a BOARD of APPEALS case? (Circle One) YES NO

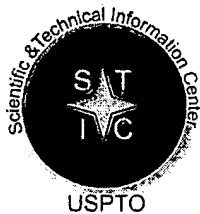
Is this case a SPECIAL CASE? (Circle One) YES NO

The ~~top~~ search should focus on whether machine learning (a form of artificial intelligence) has been utilized to optimize remote method call invocation. Machine learning and its subsets such as genetic algorithms are well known as tools to optimize a variety of processes. However, I have been unable to find instances where the machine learning has been utilized in call invocation as a part of pre-processing.

STIC Searcher Ruth Spink Phone 2-3524

Date picked up 9/26/06 Date Completed 9/26/06





STIC Search Report

EIC 2100

STIC Database Tracking Number: 20238

TO: Dohm Chankong
Location: RND 4A40
Art Unit: 2152
Tuesday, September 26, 2006

Case Serial Number: 09/893829

From: Ruth E. Spink
Location: EIC 2100
RND-4B31
Phone: 23524

Ruth.spink@uspto.gov

Search Notes

Dohm- Attached is the foreign patent and NPL search for the above referenced case. I flagged the references that I think are the best. Be sure to contact me if you wish to refocus this search.

Ruth

| Set | Items | Description |
|--|--------|--|
| S1 | 77656 | ARTIFICIAL () INTELLIGENCE OR AI OR MACHINE () LEARN? OR - GENETIC () ALGORITHM? ? |
| S2 | 237499 | CALL OR CALLS |
| S3 | 1147 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) S2 |
| S4 | 6 | S3 (30N) S1 |
| S5 | 6 | IDPAT (sorted in duplicate/non-duplicate order) |
| S6 | 6 | IDPAT (primary/non-duplicate records only) |
| S7 | 47337 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) (METHO- D? ? OR FUNCTION? ? OR ROUTINE? ? OR AGENT? ? OR MODULE? ? OR PROGRAM? ? OR SUBROUTINE? ?) |
| S8 | 489 | S7 (30N) S1 |
| S9 | 31704 | PREPROCESS? OR PRE()PROCESS? |
| S10 | 4 | S8 (30N) S9 |
| S11 | 4 | S10 NOT S6 |
| S12 | 4 | IDPAT (sorted in duplicate/non-duplicate order) |
| S13 | 4 | IDPAT (primary/non-duplicate records only) |
| S14 | 201 | S8 AND IC=G06F |
| S15 | 963 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) (REQUE- ST? ? OR REQUESTING) |
| S16 | 3 | S15 (30N) S1 |
| S17 | 3 | S16 NOT (S13 OR S6) |
| S18 | 3 | IDPAT (sorted in duplicate/non-duplicate order) |
| S19 | 3 | IDPAT (primary/non-duplicate records only) |
| S20 | 17917 | PROXY OR PROXIES |
| S21 | 1 | S8 (30N) S20 |
| S22 | 1 | S21 NOT (S6 OR S13 OR S19) |
| File 348:EUROPEAN PATENTS 1978-2006/ 200638 | | |
| (c) 2006 European Patent Office | | |
| File 349:PCT FULLTEXT 1979-2006/UB=20060921UT=20060914 | | |
| (c) 2006 WIPO/Thomson | | |
| File 350:Derwent WPIX 1963-2006/UD=200660 | | |
| (c) 2006 The Thomson Corporation | | |

6/5,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
(c) 2006 The Thomson Corporation. All rts. reserv.

0015677097 - Drawing available
WPI ACC NO: 2006-241287/200625
Related WPI Acc No: 2002-256761; 2003-764990; 2005-365372
XRPX Acc No: N2006-206981

Method of operating wireless communication system, involves monitoring local, extended and distant communication paths between communication modules and docking bays, using Artificial intelligence-based distributive routing system

Patent Assignee: WAHOO COMMUNICATIONS CORP (WAHO-N)

Inventor: PETERMANN J

Patent Family (2 patents, 109 countries)

| Patent Number | Kind | Date | Application Number | Kind | Date | Update |
|---------------|------|----------|--------------------|------|----------|----------|
| WO 2006031512 | A2 | 20060323 | WO 2005US31711 | A | 20050907 | 200625 B |
| US 7085560 | B2 | 20060801 | US 2000583839 | A | 20000531 | 200650 E |
| | | | US 200263283 | A | 20020408 | |
| | | | US 2004610087 | P | 20040915 | |
| | | | US 2004937158 | A | 20040923 | |

Priority Applications (no., kind, date): US 2004937158 A 20040923; US 200263283 A 20020408; US 2000583839 A 20000531; US 2004610087 P 20040915

Patent Details

| Number | Kind | Lan | Pg | Dwg | Filing Notes |
|---|------|-----|-----|-----|--------------|
| WO 2006031512 | A2 | EN | 142 | 18 | |
| National Designated States,Original: AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KM KP KR KZ LC LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NG NI NO NZ OM PG PH PL PT RO RU SC SD SE SG SK SL SM SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW | | | | | |
| Regional Designated States,Original: AT BE BG BW CH CY CZ DE DK EA EE ES FI FR GB GH GM GR HU IE IS IT KE LS LT LU LV MC MW MZ NA NL OA PL PT RO SD SE SI SK SL SZ TR TZ UG ZM ZW | | | | | |
| US 7085560 | B2 | EN | | | |

C-I-P of application US 2000583839
C-I-P of application US 200263283
Related to Provisional US 2004610087
C-I-P of patent US 6374078
C-I-P of patent US 6842617

Alerting Abstract WO A2

NOVELTY - The local, extended and distant communication paths between communication modules and docking bays, are monitored using decentralized **Artificial intelligence** -based distributive routing system. The half-duplex signals are asynchronously transmitted and received over paths using global positioning system (GPS)-based frequency reference source. The paths are re-directed to **optimize call** loads of signal and network extenders.

DESCRIPTION - An INDEPENDENT CLAIM is also included for wireless communication system.

USE - For operating wireless communication system (claimed) transmitting and receiving voice and data signals within internal communication networks and to external communication networks.

ADVANTAGE - Provides user with the ability to select various communication paths and calling bandwidths as needed, and also provides secure operation and emergency notification, and allows for control of operational state of internal network and optional remote control of operational state of systems external to network.

DESCRIPTION OF DRAWINGS - The figure shows the schematic view of wireless communication system.

14 fiber optic network
15 internet service provider
16 private optical network
18 central office
19 public-switched telephone network

Title Terms/Index Terms/Additional Words: METHOD; OPERATE; WIRELESS;
COMMUNICATE; SYSTEM; MONITOR; LOCAL; EXTEND; DISTANCE; PATH; MODULE; DOCK
; BAY; ARTIFICIAL; INTELLIGENCE; BASED; DISTRIBUTE; ROUTE

Class Codes

International Classification (+ Attributes)
IPC + Level Value Position Status Version
H04Q-0007/20 A I F B 20060101

File Segment: EPI;

DWPI Class: W01

Manual Codes (EPI/S-X): W01-B03A; W01-B05A; W01-C02A7

...extended and distant communication paths between communication modules and docking bays, are monitored using decentralized **Artificial intelligence** -based distributive routing system. The half-duplex signals are asynchronously transmitted and received over paths using global positioning system (GPS)-based frequency reference source. The paths are re-directed to **optimize call** loads of signal and network extenders.

6/5,K/2 (Item 2 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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0014064108 - Drawing available

WPI ACC NO: 2004-246981/

XRPX Acc No: N2004-195916

Switch for voice-based communication system, has gateway server to generate learned information in response to routing information stored in server and in response to switched call

Patent Assignee: CLARK C Y C (CLAR-I); GANESAN S (GANE-I); JOHNSON L G (JOHN-I); SULLIVAN R J (SULL-I)

Inventor: CLARK C Y C; GANESAN S; JOHNSON L G; SULLIVAN R J

Patent Family (1 patents, 1 countries)

| Patent Number | Kind | Date | Application Number | Kind | Date | Update |
|----------------|------|----------|--------------------|------|----------|----------|
| US 20040042469 | A1 | 20040304 | US 2002235187 | A | 20020904 | 200423 B |

Priority Applications (no., kind, date): US 2002235187 A 20020904

Patent Details

| Number | Kind | Lan | Pg | Dwg | Filing Notes |
|----------------|------|-----|----|-----|--------------|
| US 20040042469 | A1 | EN | 16 | 6 | |

Alerting Abstract US A1

NOVELTY - The switch (100) has an ingress port to receive an incoming call and a gateway server (112) to store routing information. An egress port coupled to a switching fabric communicates with an outgoing call in response to a switched call. A gateway server (114) coupled to the server (112) generates a learned information in response to the routing information stored in the server (112) and in response to the switched call.

DESCRIPTION - INDEPENDENT CLAIMS are also included for the following:

- 1.a method of operating a switch
- 2.a method for operating policy server
- 3.a method of learning routes
- 4.a system for learning call routing information
- 5.a method for managing a call.

USE - Used for processing voice traffic in a voice-based communication system.

ADVANTAGE - The switch provides a self learning application **server and** hence uses artificial intelligence techniques and caching algorithms to learn new more-efficient routing paths or initial routing paths based on **the** incoming and outgoing calls. The **switch** is capable of optimizing routing in a network with dynamic and changing numbers.

DESCRIPTION OF DRAWINGS - The drawing shows a switch including a two-way trunk group.

100Switch
112,114Gateway server
116Policy server
120Switching fabric
130End user

Title Terms/Index Terms/Additional Words: SWITCH; VOICE; BASED; COMMUNICATE ; SYSTEM; GATEWAY; SERVE; GENERATE; INFORMATION; RESPOND; ROUTE; STORAGE; CALL

Class Codes

International Classification (Main): H04L-012/28
US Classification, Issued: 370401000

File Segment: EPI;
DWPI Class: W01
Manual Codes (EPI/S-X): W01-C02A1A; W01-C02A7

Alerting Abstract ...ADVANTAGE - The switch provides a self learning application **server** and hence uses artificial intelligence techniques and caching algorithms to learn new more-efficient routing paths or initial routing paths based on **the** incoming and outgoing calls. The **switch** is capable of optimizing routing in a network with dynamic and changing numbers...

6/5,K/3 (Item 3 from file: 348)
DIALOG(R)File 348:EUROPEAN PATENTS
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01067907

GENETIC PROCEDURE FOR ALLOCATION OF ELEVATOR CALLS
GENETRISCHES VERFAHREN ZUR ZUTEILUNG DER AUFZUGSZIELRUFE
PROCEDURE GENETIQUE POUR L'AFFECTATION D'APPELS D'ASCENSEURS

PATENT ASSIGNEE:

Kone Corporation, (339266), Kartanontie 1, 00330 Helsinki, (FI),
(Proprietor designated states: all)

INVENTOR:

YLINEN, Jari, Kutojankatu 36, FIN-05800 Hyvinkaa, (FI)
TYNI, Tapio, Vehmaskorventie 6, FIN-05620 Hyvinkaa, (FI)

LEGAL REPRESENTATIVE:

Zipse + Habersack (100501), Wotanstrasse 64, 80639 Munchen, (DE)
PATENT (CC, No, Kind, Date): EP 1040071 A2 001004 (Basic)
EP 1040071 B1 060315
WO 1999033741 990708

APPLICATION (CC, No, Date): EP 98962454 981223; WO 98FI1015 981223

PRIORITY (CC, No, Date): FI 974613 971223

DESIGNATED STATES: CH; DE; FR; GB; LI; NL

INTERNATIONAL PATENT CLASS (V7): B66B-001/18

INTERNATIONAL CLASSIFICATION (V8 + ATTRIBUTES):

IPC + Level Value Position Status Version Action Source Office:

B66B-0001/18 A I F B 20060101 19990720 H EP

NOTE:

No A-document published by EPO

LEGAL STATUS (Type, Pub Date, Kind, Text):

Application: 001004 A2 Published application without search report

Application: 990908 A2 International application. (Art. 158(1))

Grant: 060315 B1 Granted patent

Examination: 030521 A2 Date of dispatch of the first examination
report: 20030410

Examination: 001004 A2 Date of request for examination: 20000724

Application: 990908 A2 International application entering European
phase

LANGUAGE (Publication,Procedural,Application): English; English; English

FULLTEXT AVAILABILITY:

| Available Text | Language | Update | Word Count |
|----------------|----------|--------|------------|
|----------------|----------|--------|------------|

| | | | |
|----------|-----------|--------|-----|
| CLAIMS B | (English) | 200611 | 585 |
|----------|-----------|--------|-----|

| | | | |
|----------|----------|--------|-----|
| CLAIMS B | (German) | 200611 | 501 |
|----------|----------|--------|-----|

| | | | |
|----------|----------|--------|-----|
| CLAIMS B | (French) | 200611 | 669 |
|----------|----------|--------|-----|

| | | | |
|--------|-----------|--------|------|
| SPEC B | (English) | 200611 | 4204 |
|--------|-----------|--------|------|

| | |
|-------------------------------|---|
| Total word count - document A | 0 |
|-------------------------------|---|

| | |
|-------------------------------|------|
| Total word count - document B | 5959 |
|-------------------------------|------|

| | |
|------------------------------------|------|
| Total word count - documents A + B | 5959 |
|------------------------------------|------|

...SPECIFICATION control according to the invention, decision-making is
based on route optimisation effected using a **genetic algorithm**. In
the route **optimisation**, each landing **call** is served. A problem in the
route optimisation is exponential increase of the number of...

6/5,K/4 (Item 4 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01203993

METHODS AND APPARATUS FOR ASSIGNING ELEVATOR HALL CALLS TO MINIMIZE ENERGY USE

PROCEDES ET APPAREIL POUR ATTRIBUER DES APPELS D'ASCENSEURS AFIN DE REDUIRE L'UTILISATION DE L'ENERGIE

Patent Applicant/Assignee:

THYSSEN ELEVATOR CAPITAL CORP, 15141 East Whittier Blvd., Whittier, CA 90603, US, US (Residence), US (Nationality), (For all designated states except: US)

Patent Applicant/Inventor:

SMITH Rory, 2253 Monarch Ridge Circle, El Cajon, CA 92019, US, US (Residence), US (Nationality), (Designated only for: US)

PETERS Richard D, Boundary House, Missenden Road, Great Kingshill, Bucks HP 15 6EB, GB, GB (Residence), GB (Nationality), (Designated only for: US)

Legal Representative:

SCHMIT David E (agent), Frost, Brown & Todd LLC, 2200 PNC Center, 201 East Fifth Street, Cincinnati, OH 45202, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200509880 A1 20050203 (WO 0509880)

Application: WO 2004US18192 20040607 (PCT/WO US04018192)

Priority Application: US 2003615429 20030707

Designated States:

(All protection types applied unless otherwise stated - for applications 2004+)

AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM
DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO
RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO
SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class (v7): B66B-001/20

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 2518

English Abstract

Energy saving methods and apparatus for elevator systems having a plurality of elevator cars operating in a plurality of elevator shafts are disclosed. The present invention provides methods and apparatus for determining which one of the plurality of elevator cars is to be assigned to a new hall call in order to reduce the net energy consumption of the elevator system over time.

French Abstract

L'invention concerne des procedes et un appareil permettant d'economiser l'energie concus pour des systemes d'ascenseurs comptant plusieurs cabines fonctionnant dans plusieurs cages d'ascenseurs. L'invention concerne des procedes et un appareil permettant de determiner, parmi les nombreuses cabines d'ascenseurs, celle qui doit etre attribuee a un nouvelle appel d'ascenseur, le but etant de reduire la consommation nette d'energie du systeme d'ascenseurs sur la duree.

Legal Status (Type, Date, Text)

Publication 20050203 A1 With international search report.

Publication 20050203 A1 Before the expiration of the time limit for
amending the claims and to be republished in the
event of the receipt of amendments.

Fulltext Availability:
Detailed Description

Detailed Description

... to a group of elevator cars. Typically, the existing systems and
methods use neural networks, **genetic algorithms**, and/or fuzzy logic
to **optimize** hall **call** allocations based on criteria such as waiting
time, time to destination, and elevator usage. These...

6/5,K/5 (Item 5 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00463111 **Image available**

TRANSPARENT NON-DISRUPTABLE ATM NETWORK

RESEAU EN MODE DE TRANSFERT ASYNCHRONE TRANSPARENT NON PERTURBABLE

Patent Applicant/Assignee:

TRUSTEES OF THE STEVENS INSTITUTE OF TECHNOLOGY,

Inventor(s):

VAMAN Dhadesugoor R,

NOH Tai,

BOSE Jay D,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9853575 A1 19981126

Application: WO 98US10128 19980519 (PCT/WO US9810128)

Priority Application: US 97862631 19970523

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AT CA JP KR AT BE CH CY DE DK ES FI FR GB GR IE IT LU MC NL PT SE

Main International Patent Class (v7): H04L-011/20

International Patent Class (v7): H04J-03:24

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 9693

English Abstract

A method and apparatus for the transparent, non-disruptable transfer of data, particularly multimedia data, through any packet-based network, such as an ATM network is provided. The method of the present invention includes the step of setting a primary path and a secondary path between nodes of a network, or of a network domain. Accordingly, when a switch or node establishes a Virtual Path (VP) to another switch with specified effective bandwidth, it also has an alternate VP that is available, although no bandwidth is actually used. The method of the present invention further includes the step of optimizing the available capacity of the system through management actions. For handling congestion and resource failures, the total effective bandwidth on each physical link is categorized in terms of idle capacity (unused or available), used capacity (for existing VPs), and spare capacity. When a resource failure occurs, the idle capacity is used for real-time switching of the VP and service is not disrupted. This is accomplished by an alarm indication management cell which is delivered when a resource problem is encountered. This management cell sets forth the secondary path and the bandwidth associated therewith. On the other hand, if idle capacity does not exist, the spare capacity is used, while the bandwidth for all other VPs is reconfigured using virtual bandwidth optimization. Therefore, service disruption does not occur. In a wireless, mobile network, the present invention monitors node movement and takes management actions on the basis of such node movement to prevent service disruption.

French Abstract

Procede et appareil de transfert transparent et non perturbable de donnees, en particulier de donnees de multimedia, par un reseau sur la base de paquets, tel qu'un reseau a mode de transfert asynchrone (ATM). Le procede selon la presente invention consiste a etablir un trajet primaire et un trajet secondaire entre des noeuds d'un reseau, ou d'un domaine de reseau. Selon la presente invention, lorsqu'un commutateur ou noeud etablit un trajet virtuel (VP) vers un autre commutateur avec une largeur de bande effective specifiee, il possede egalement un autre VP qui est disponible, bien qu'aucune largeur de bande ne soit effectivement utilisee. Ledit procede consiste en outre a optimiser la capacite

disponible du systeme par des mesures de gestion. Pour repondre a l'encombrement et aux defaillances de ressources, la largeur de bande effective totale sur chaque liaison physique est categorisee en terme de capacite inexploitee (inutilisee ou disponible), de capacite utilisee (pour les VP existants) et de capacite de reserve. Lorsqu'une defaillance de ressources se produit, la capacite inexploitee est utilisee pour la commutation en temps reel du VP et le service n'est pas perturbe. Cela est accompli par une cellule de gestion d'indication d'alarme qui est fournie lorsqu'un probleme de ressources est rencontre. Cette cellule de gestion invoque le trajet secondaire et la largeur de bande qui lui est associee. D'un autre cote, s'il n'y a pas de capacite inexploitee, c'est la capacite de reserve qui est utilisee, tandis que la largeur de bande de tous les autres VP est reconfiguree a l'aide de l'optimisation de la largeur de bande virtuelle. Par consequent, la perturbation de service ne se produit pas. Dans un reseau mobile sans fil, la presente invention permet la surveillance du mouvement des noeuds et la prise de mesures de gestion sur la base du mouvement des noeuds pour empecher la perturbation du service.

Fulltext Availability:
Detailed Description

Detailed Description

... The first is computation of call blocking probabilities for each switch pair using recursion for **optimization**, that is, minimizing the maximum **call** blocking probability for a service class i VP bandwidth assignment for all switch pairs.

Call blocking probability, $P_{bi}(swp)$ for a given switch pair is computed by using d_i and a_i , where d_i is the resource units allocated to class i service units and a_i is...

6/5,K/6 (Item 6 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00340063 **Image available**

CONTROL SYSTEMS BASED ON SIMULATED VIRTUAL MODELS
SYSTEMES DE COMMANDE BASES SUR DES MODELES VIRTUELS SIMULES

Patent Applicant/Assignee:

INTERTECH VENTURES LTD,
THALHAMMER-REYERO Cristina,

Inventor(s):

THALHAMMER-REYERO Cristina,

Patent and Priority Information (Country, Number, Date):

Patent: WO 9622575 A1 19960725

Application: WO 96US883 19960117 (PCT/WO US9600883)

Priority Application: US 95373688 19950117; US 95373992 19950117

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

CA JP US AT BE CH DE DK ES FR GB GR IE IT LU MC NL PT SE

Main International Patent Class (v7): G06F-019/00

International Patent Class (v7): G06F-09:44

Publication Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 135683

English Abstract

This invention describes a computer-based system (112), methods and visual interfaces for providing an integrated development and deployment framework for visual modeling and dynamic simulation of virtual models of complex systems, which can be further integrated with monitoring (108) and control (138) devices to monitor and control the operation of the complex systems modeled (102) and can be used for information retrieval. More particularly, the virtual models in the present invention relate to visual models of biochemical complex systems, comprising sets of icons representing processes and their participants linked into multidimensional pathways (116), further organized in a hierarchy of icons representing discrete time and space compartments, wherein such compartments may contain other compartments, and wherein those modular icons encapsulate in different layers all the information, data, and mathematical models that characterize and define each virtual model.

French Abstract

L'invention porte sur un systeme informatique (112), sur un procede et sur des interfaces representant un cadre de developpement et de deploiement pour le modelage visuel et la simulation dynamique de modeles virtuels de systemes complexes pouvant ensuite etre integres a des dispositifs de controle (108) et de commande (138) d'exploitation des systemes complexes ainsi modeles (102) et peuvent etre utilises pour la recherche d'informations. Les modeles virtuels de la presente invention peuvent se rapporter a des modeles visuels de systemes de complexes biochimiques comprenant des ensembles d'icomes representant des processus et leurs participants lies par des chemins pluridimensionnels (116) qui sont ensuite organises selon une hierarchie d'icomes representant des compartiments discrets dans le temps et dans l'espace, lesdits compartiments pouvant en contenir d'autres et lesdites icomes modulaires pouvant englober dans differentes couches toutes les informations, donnees et modeles mathematiques caracterisant et definissant chacun des modeles virtuels.

Fulltext Availability:

Detailed Description

Detailed Description

... biotechnology, chemical, food, environmental and all 'v or her can
millions of dollars by using **artificial intelligence** for process
optimization to control complex
production facilities, . Using lar@4, ye--@caleculti%-ation) fmcr(x) rLv
ganisnis or niamniahah...

13/5,K/1 (Item 1 from file: 350)
DIALOG(R)File 350:Derwent WPIX
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0008804291

WPI ACC NO: 1998-349551/

XRAM Acc No: C1998-108071

XRPX Acc No: N1998-272808

Paper production control from wood pulp - using spectral measurements for evaluation and model building to control the pulping and refining stages

Patent Assignee: SIEMENS AG (SIEI)

Inventor: FURUMOTO H; KESSLER R; LAMPE U; ROTH C; ZEINER G

Patent Family (6 patents, 19 countries)

| Patent Number | Kind | Date | Application Number | Kind | Date | Update |
|---------------|------|----------|--------------------|------|----------|----------|
| DE 19653532 | A1 | 19980625 | DE 19653532 | A | 19961220 | 199831 B |
| WO 1998028486 | A1 | 19980702 | WO 1997DE2989 | A | 19971219 | 199832 E |
| EP 946815 | A1 | 19991006 | EP 1997953658 | A | 19971219 | 199946 E |
| | | | WO 1997DE2989 | A | 19971219 | |
| DE 19653532 | C2 | 20010301 | DE 19653532 | A | 19961220 | 200112 E |
| EP 946815 | B1 | 20020313 | EP 1997953658 | A | 19971219 | 200219 E |
| | | | WO 1997DE2989 | A | 19971219 | |
| DE 59706635 | G | 20020418 | DE 59706635 | A | 19971219 | 200227 E |
| | | | EP 1997953658 | A | 19971219 | |
| | | | WO 1997DE2989 | A | 19971219 | |

Priority Applications (no., kind, date): DE 19653532 A 19961220

Patent Details

| Number | Kind | Lan | Pg | Dwg | Filing Notes |
|--|------|-----|----|-----|-------------------------------|
| DE 19653532 | A1 | DE | 13 | 7 | |
| WO 1998028486 | A1 | DE | | | |
| National Designated States,Original: BR CA US | | | | | |
| Regional Designated States,Original: AT BE CH DE DK ES FI FR GB GR IE IT | | | | | |
| LU MC NL PT SE | | | | | |
| EP 946815 | A1 | DE | | | PCT Application WO 1997DE2989 |
| Based on OPI patent WO 1998028486 | | | | | |
| Regional Designated States,Original: AT DE FI SE | | | | | |
| EP 946815 | B1 | DE | | | PCT Application WO 1997DE2989 |
| Based on OPI patent WO 1998028486 | | | | | |
| Regional Designated States,Original: AT DE FI SE | | | | | |
| DE 59706635 | G | DE | | | Application EP 1997953658 |
| PCT Application WO 1997DE2989 | | | | | |
| Based on OPI patent EP 946815 | | | | | |
| Based on OPI patent WO 1998028486 | | | | | |

Alerting Abstract DE A1

In the process control for the prodn. of paper from wood fibres, especially from wood chips and/or refiner products, spectra are measured at least at one point from electromagnetic radiation and/or mechanical characteristics at the material or the fibre suspension pulp or at a sample paper sheet produced from the raw material. Discrete mechanical and/or chemical characteristics of the material are registered at least at one point. Characteristic values are developed from the evaluation of the spectra, and a condition model is formed from the characteristics and the discrete mechanical and/or chemical characteristics and/or they are passed with the process characteristics to a process model. The condition model and/or the process model are used for process control.

Also claimed is an appts. with at least one spectrometer (101-103), a digital computer (105) to evaluate the spectra and form the models for the condition and/or process from the characteristic values, the discrete characteristics and the process characteristics if required. The process control system (100) has a feedback for the optimum setting values from the models, as the outputs from the process models.

ADVANTAGE - The technique gives optimum processing of the paper from raw wood and refined materials and especially control of the refiner operation.

Title Terms/Index Terms/Additional Words: PAPER; PRODUCE; CONTROL; WOOD; PULP; SPECTRAL; MEASURE; EVALUATE; MODEL; BUILD; REFINE; STAGE

Class Codes

International Classification (Main): D21B-001/04, D21C-005/00
(Additional/Secondary): D21B-001/18, D21D-001/20, D21H-023/78, G01J-003/00
, G01N-021/62, G01N-033/34

File Segment: CPI; EPI

DWPI Class: F09; S03

Manual Codes (EPI/S-X): S03-A02; S03-E04D; S03-E14G

Manual Codes (CPI/A-M): F05-A02A

Documentation Abstract

...or water addition and/or refiner throughput which, with the quality parameters, are used to **optimise** the process. The cost **function** is developed, which is **optimised** through suitable variations in the setting values using Fuzzy logic, a neural network and/or **genetic algorithms**. The cost function is for the prodn. costs and/or profit function. The spectra are **preprocessed** and compressed, with specific measured counts of the spectra such as the primary components to...

13/5,K/2 (Item 2 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01210618

METHOD OF DIAGNOSING COLORECTAL ADENOMAS AND CANCER USING INFRARED SPECTROSCOPY

PROCEDE DE DIAGNOSTIC D'ADENOMES ET DU CANCER COLORECTAUX AU MOYEN DE LA SPECTROSCOPIE INFRAROUGE

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Patent Applicant/Inventor:

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200517501 A1 20050224 (WO 0517501)
Application: WO 2004CA1462 20040805 (PCT/WO CA04001462)
Priority Application: US 2003494781 20030814

Designated States:

(All protection types applied unless otherwise stated - for applications
2004+)

AE AG AL AM AT AU AZ BA BB BG BR BW BY BZ CA CH CN CO CR CU CZ DE DK DM
DZ EC EE EG ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC
LK LR LS LT LU LV MA MD MG MK MN MW MX MZ NA NI NO NZ OM PG PH PL PT RO
RU SC SD SE SG SK SL SY TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW
(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PL PT RO
SE SI SK TR
(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG
(AP) BW GH GM KE LS MW MZ NA SD SL SZ TZ UG ZM ZW
(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class (v7): G01N-021/35

International Patent Class (v7): G01N-033/48; G01N-033/483

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 4178

English Abstract

Infrared spectroscopy of human stool can be used as a non-invasive method of detecting the presence of colorectal cancer and/or clinically significant adenomas. The spectrum of a patient's stool is compared with that of stool from non-cancerous subjects, observed differences in spectra being indicative of cancer and/or clinically significant adenomas. In a preferred method, the stool sample is mixed with a buffer, the resulting suspension is centrifuged and the supernatant is subjected to infrared spectroscopy. The spectra are then classified using a three-stage classification strategy.

French Abstract

L'invention porte sur la spectroscopie infrarouge des selles humaines qui

peut etre utilisee en tant que procede non invasif de detection de la presence du cancer colorectal et/ou d'adenomes cliniquement graves. Le spectre des selles d'un patient est compare a celui des selles de sujets qui ne sont pas atteints de cancer, les differences observees dans les spectres indiquant un cancer et/ou des adenomes cliniquement graves. Dans un mode de realisation prefere, l'echantillon de selles est melange a une solution tampon, la suspension obtenue etant centrifugee et le surnageant etant soumis a une spectroscopie infrarouge. Les spectres sont ensuite classes au moyen d'une strategie de classification en trois etapes.

Legal Status (Type, Date, Text)

Publication 20050224 A1 With international search report.

Publication 20050224 A1 Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

Fulltext Availability:

Detailed Description

Detailed Description

... of spectra of biomedical origin. The strategy comprises three stages. The first stage is a **preprocessing** step, found to be preferred for reliable classification. It consists of selecting from the spectra a few maximally discriminatory subregions, using an optimal region selection (ORS) algorithm, based on a **genetic algorithm** (GA)-driven **optimization method** (A.E. Nikulin et al, NMR in Biomedicine 11, 209-217 (1998), Near-optimal Region Selection for Feature Space Reduction: Novel **Preprocessing** Methods for Classifying MR spectra; T. Bezabeh et al, The Use of 1H Magnetic Resonance...

19/5,K/3 (Item 3 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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01030758 **Image available**

COMPUTER-IMPLEMENTED SYSTEM AND METHOD FOR MEASURING AND IMPROVING
MANUFACTURING PROCESSES AND MAXIMIZING PRODUCT RESEARCH AND DEVELOPMENT
SPEED AND EFFICIENCY

SYSTEME ET PROCEDE INFORMATIQUES POUR MESURER ET AMELIORER LES PROCESSUS DE
FABRICATION ET MAXIMISER LA VITESSE ET L'EFFICACITE DE RECHERCHE ET DE
DEVELOPPEMENT DE PRODUITS

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Patent and Priority Information (Country, Number, Date):

Patent: WO 200360812 A2-A3 20030724 (WO 0360812)

Application: WO 2003US1272 20030115 (PCT/WO US0301272)

Priority Application: US 2002348871 20020115

Designated States:

(Protection type is "patent" unless otherwise stated - for applications
prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ
EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR
LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SC SD SE SG
SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IT LU MC NL PT SE SI
SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class (v7): G06F-019/00

International Patent Class (v7): G05B-013/02

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 14453

English Abstract

An integrated multi-step computer-implemented system and method for
measuring and improving manufacturing processes and maximizing product
research and development speed and efficiency is disclosed. The system
includes a predictive model (306) that predicts output from data input,
an optimizer (308) that optimizes input variables based upon desired
output variables, and a library (310) that stores data and information.
The system further includes an artificial intelligence (304) that

receives requests and information from manufacturers (324) and customers (330), and directs the requests and information to the predictive model (306) if an output prediction is requested, to the optimizer (308) if an optimized input is requested, or to the library (310) if the requests cannot be answered by the predictive model (306) or optimizer (308). The predictive model (306), the optimizer (308), and the library (310) all interconnect with the artificial intelligence (324). The system further includes a high-throughput screening system (340) that analyzes various material combinations and sends data to the library (310).

French Abstract

Cette invention se rapporte a un systeme et a un procede informatiques en plusieurs etapes integrees, qui servent a mesurer et a ameliorer les processus de fabrication et a maximiser la vitesse et l'efficacite de recherche et de developpement de produits. Ce systeme comprend un modele predictif qui prevoit les resultats de sortie a partir de donnees d'entree, un optimiseur qui optimise les variables d'entree sur la base des variables de sortie souhaitees, et une bibliotheque qui memorise les donnees et les informations. Ce systeme utilise en outre une intelligence artificielle qui recoit les demandes et les informations en provenance des fabricants et des clients, et qui adresse ces demandes et ces informations au modele predictif lorsqu'une prevision de sortie est demandee, a l'optimiseur lorsqu'une entree optimisee est demandee ou a la bibliotheque lorsque le modele predictif ou l'optimiseur ne peuvent pas repondre aux demandes. Le modele predictif, l'optimiseur et la bibliotheque sont tous trois connectes a l'intelligence artificielle. Ce systeme comprend en outre un systeme de triage a debit eleve qui analyse diverses combinaisons de materiels et envoie les donnees a la bibliotheque.

Legal Status (Type, Date, Text)

Publication 20030724 A2 Without international search report and to be republished upon receipt of that report.
Examination 20031002 Request for preliminary examination prior to end of 19th month from priority date
Search Rpt 20031218 Late publication of international search report
Republication 20031218 A3 With international search report.

Fulltext Availability:

Detailed Description

Detailed Description

... the search criteria. In the event that information that matches the search criteria is found, **artificial intelligence 304** will activate **optimizer 308**. **Artificial intelligence 304** will **request** additional high throughput screening and/or laboratory testing at specific conditions based on the **request** of the **optimizer 304**. **Artificial intelligence 304** will coordinate the search and retrieval of external sources such as the Internet for...including the above-mentioned techniques. Preferably, however, **optimizer 308** will perform - 26 the following functions. **Optimizer 308 requests artificial intelligence 304** to supply data from library 310 on certain performances in a certain requested range...range where the solution is expected. Extrapolation or interpolation is possible. Based on this estimate, **optimizer 308** will **request artificial intelligence 304** to coordinate the gathering of additional data to confirm the estimation. **Artificial intelligence 304** will

22/5,K/1 (Item 1 from file: 349)
DIALOG(R)File 349:PCT FULLTEXT
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00993654 **Image available**

LOAD BALANCING METHOD FOR EXCHANGING DATA BETWEEN MULTIPLE HOSTS AND STORAGE ENTITIES, IN IP BASED STORAGE AREA NETWORK

PROCEDE D'EQUILIBRAGE DE CHARGE POUR L'ECHANGE DE DONNEES ENTRE PLUSIEURS HOTES ET ENTITES DE MEMORISATION DANS UN RESEAU DE STOCKAGE A BASE IP

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Legal Representative:

HELFGOTT Samson (et al) (agent), Katten Muchin Zavis Rosenman, 575

Madison Avenue, New York, NY 10022-2585, US,

Patent and Priority Information (Country, Number, Date):

Patent: WO 200323640 A2-A3 20030320 (WO 0323640)

Application: WO 2002US28417 20020906 (PCT/WO US02028417)

Priority Application: US 2001317860 20010907

Designated States:

(Protection type is "patent" unless otherwise stated - for applications prior to 2004)

AE AG AL AM AT AU AZ BA BB BG BR BY BZ CA CH CN CO CR CU CZ DE DK DM DZ

EC EE ES FI GB GD GE GH GM HR HU ID IL IN IS JP KE KG KP KR KZ LC LK LR

LS LT LU LV MA MD MG MK MN MW MX MZ NO NZ OM PH PL PT RO RU SD SE SG SI

SK SL TJ TM TN TR TT TZ UA UG US UZ VC VN YU ZA ZM ZW

(EP) AT BE BG CH CY CZ DE DK EE ES FI FR GB GR IE IT LU MC NL PT SE SK TR

(OA) BF BJ CF CG CI CM GA GN GQ GW ML MR NE SN TD TG

(AP) GH GM KE LS MW MZ SD SL SZ TZ UG ZM ZW

(EA) AM AZ BY KG KZ MD RU TJ TM

Main International Patent Class (v7): G06F-009/312

International Patent Class (v7): G06F-009/312

Publication Language: English

Filing Language: English

Fulltext Availability:

Detailed Description

Claims

Fulltext Word Count: 4011

English Abstract

The present invention achieves load balancing of activities on storage entities (30), operating in a storage area network (SAN) by assignment of address to each storage entity (25). The storage traffic is monitored and statistics are accumulated over an interval and then used to obtain the traffic pattern of each host-storage entity link (35). A statistical analysis is used to determine the optimal routing map from hosts to storage entity. Other heuristic including genetic algorithms may also be used. This mapping is set on the network by assigning the entity's addresses to the storage gateways (20), thus does not impose any process on the hosts (10) or the disks.

French Abstract

L'invention concerne l'équilibrage de charge d'activités sur des entités de mémorisation opérant dans un réseau de stockage (SAN) par l'attribution d'une adresse à chaque entité de mémorisation. Le trafic de stockage est surveillé et les statistiques sont accumulées pendant un laps de temps donné, pour ensuite être utilisées afin de réaliser le modèle de trafic de chaque lien d'entité de mémorisation hôte. Une

analyse statistique sert a determiner la carte de routage optimale des hotes vers l'entite de memorisation, d'autres connaissances heuristiques comprenant des algorithmes genetiques pouvant aussi etre utilisees. Ce mappage est applique au reseau par allocation des adresses d'entites aux passerelles de memorisation, supprimant ainsi toute operation sur les hotes ou les disques.

Legal Status (Type, Date, Text)

Publication 20030320 A2 Without international search report and to be republished upon receipt of that report.

Search Rpt 20040311 Late publication of international search report

Republication 20040311 A3 With international search report.

Fulltext Availability:

Detailed Description

Detailed Description

... a further embodiment the network is constructed from at least one of several hosts, several **proxies** and several IP storage endpoints comprised of at least one of a storage entity with IP interface or a storage gateway.

The optimal routing may also comprise an **optimization** determined by a fitness **function** including at least one of a **genetic algorithm** ; a simulated annealing or a tabular

| Set | Items | Description |
|-----|-------|--|
| S1 | 6100 | ARTIFICIAL () INTELLIGENCE OR AI OR MACHINE () LEARN? OR - GENETIC () ALGORITHM? ? OR NEURAL()NETWORK? |
| S2 | 63580 | CALL OR CALLS |
| S3 | 31 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) S2 |
| S4 | 2699 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) (METHO- D? ? OR FUNCTION? ? OR ROUTINE? ? OR AGENT? ? OR MODULE? ? OR PROGRAM? ? OR SUBROUTINE? ?) |
| S5 | 60 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) (REQUE- ST? ? OR REQUESTING) |
| S6 | 5873 | PREPROCESS? OR PRE()PROCESS? |
| S7 | 1128 | PROXY OR PROXIES |
| S8 | 102 | (S3 OR S4 OR S5) AND S1 |
| S9 | 0 | S3 AND S1 |
| S10 | 101 | S4 AND S1 |
| S11 | 75 | S10 AND IC=G06F |
| S12 | 0 | S10 AND S6 |
| S13 | 65 | S10 AND PROCESS? |
| S14 | 57 | S13 AND IC=G06F |
| S15 | 57 | IDPAT (sorted in duplicate/non-duplicate order) |
| S16 | 57 | IDPAT (primary/non-duplicate records only) |
| S17 | 10 | S13 AND IC=(G06F-003 OR G06F-009 OR G06F-013) |
| S18 | 10 | IDPAT (sorted in duplicate/non-duplicate order) |
| S19 | 10 | IDPAT (primary/non-duplicate records only) |
| S20 | 0 | S10 AND S7 |
| S21 | 25 | S4 (10N) (REMOTE OR REMOTELY OR PORTABLE? ? OR MOBILE? ?) |
| S22 | 0 | S21 AND S1 |

File 347:JAPIO Dec 1976-2005/Dec(Updated 060404)

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19/5,K/1

DIALOG(R)File 347:JAPIO

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07383100 **Image available**

METHOD AND DEVICE FOR REGULATING OPTIMIZATION

PUB. NO.: 2002-251600 [JP 2002251600 A]
PUBLISHED: September 06, 2002 (20020906)
INVENTOR(s): WATANABE TATSUMI
TAKAGI HIDEYUKI
OBARA KAZUAKI
MARUNO SUSUMU
APPLICANT(s): MATSUSHITA ELECTRIC IND CO LTD
APPL. NO.: 2001-380477 [JP 2001380477]
Division of 07-301797 [JP 95301797]
FILED: November 20, 1995 (19951120)
PRIORITY: 06-289608 [JP 94289608], JP (Japan), November 24, 1994
(19941124)
07-140231 [JP 95140231], JP (Japan), June 07, 1995 (19950607)
INTL CLASS: G06N-003/00; **G06F-009/44** ; G06N-003/12

ABSTRACT

PROBLEM TO BE SOLVED: To realize a regulating method and a regulating device for efficiently regulating an apparatus optimally for a user by applying interactive **genetic algorithm** to a problem assessable only by sensibilities and a subjective value of a human being.

SOLUTION: In starting, information represented by a solution vector is indicated in an information display part, while information for facilitating comparative evaluation of a plurality of pieces of simultaneously indicated information is indicated in an auxiliary information display part. Each of solution vectors is evaluated by a user on the basis of these pieces of information. According to a history of evaluation by the user, an evaluation model for a regulation **process** is formed in a model estimation execution part, and afterward, evaluation is carried out in a mode evaluation computing part according to this model. On the basis of an adaptation degree computed in an adaptation degree computing part 105 according to the evaluation by the user or the model, an arithmetic computing **process** is carried out by a recombination operating part 108. The solution vector is optimally regulated by repeating these **processes**.

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METHOD AND DEVICE FOR REGULATING OPTIMIZATION

INTL CLASS: G06N-003/00; **G06F-009/44** ; G06N-003/12

ABSTRACT

... a regulating device for efficiently regulating an apparatus optimally for a user by applying interactive **genetic algorithm** to a problem assessable only by sensibilities and a subjective value of a human being...

... According to a history of evaluation by the user, an evaluation model for a regulation **process** is formed in a model estimation execution part, and afterward, evaluation is carried out in...

... part 105 according to the evaluation by the user or the model, an arithmetic computing **process** is carried out by a recombination operating part 108. The solution vector is optimally regulated by repeating these **processes**.

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19/5,K/2

DIALOG(R)File 347:JAPIO

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05636646 **Image available**

OPTIMIZING DEVICE AND METHOD THEREOF BY GENETIC ALGORITHM BASED ON UNBALANCED EVOLUTION THEORY

PUB. NO.: 09-251446 [JP 9251446 A]

PUBLISHED: September 22, 1997 (19970922)

INVENTOR(s): TERAOKA MASAYA
TERASAKI TAKESHI

APPLICANT(s): NRI & NCC CO LTD [420135] (A Japanese Company or Corporation)
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RES DEV CORP OF JAPAN [330319] (A Japanese Company or Corporation), JP (Japan)

APPL. NO.: 08-061408 [JP 9661408]

FILED: March 18, 1996 (19960318)

INTL CLASS: [6] G06F-015/18; G05B-013/02; G05B-015/02; **G06F-009/44** ;
G06F-017/00

JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications);
22.3 (MACHINERY -- Control & Regulation); 36.1 (LABOR SAVING
DEVICES -- Industrial Robots); 45.1 (INFORMATION **PROCESSING**
-- Arithmetic Sequence Units)

ABSTRACT

PROBLEM TO BE SOLVED: To eliminate the setting of a mutation rate and to obtain a highly optimum solution from the initial stage of optimization by selecting an optimum solution candidate obtaining maximum adaptability and judging whether the optimum solution candidate is converged to the optimum solution or not.

SOLUTION: A candidate group division generation part 4 inputs the first optimum solution candidate from an optimum solution candidate initial generation part 3, repeats division and copy for plural times and generates the candidate group of the optimum solution. An evaluation/selection part 5 calculates optimum degrees on all the optimum solution candidates from an evaluation function inputted from a data condition input part 2 and holds the highest optimum solution candidate to the next generation evolution. A convergence judgment part 6 executes convergence judgment on the selected optimum solution candidate and outputs the optimum solution candidate when the solutions are judged to be converged to the optimum one and the judgment result of the success of convergence to an output part 7. When it is judged that the solution is not converged to the optimum one and the number of generation evolution does not reach the scheduled one, the optimum solution candidate at that time is outputted to the candidate group division generation part 4 and a previous **processing** is repeated.

OPTIMIZING DEVICE AND METHOD THEREOF BY GENETIC ALGORITHM BASED ON UNBALANCED EVOLUTION THEORY

INTL CLASS: G06F-015/18; G05B-013/02; G05B-015/02; **G06F-009/44** ;
G06F-017/00

JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- ...

...Industrial Robots); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

...that time is outputted to the candidate group division generation part 4 and a previous **processing** is repeated.

19/5,K/3

DIALOG(R)File 347:JAPIO

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05439965 **Image available**

OPTIMIZATION CONTROL METHOD AND DEVICE THEREFOR

PUB. NO.: 09-054765 [JP 9054765 A]
PUBLISHED: February 25, 1997 (19970225)
INVENTOR(s): WATANABE TATSUMI
TAKAGI HIDEYUKI
OBARA KAZUAKI
MARUNO SUSUMU
APPLICANT(s): MATSUSHITA ELECTRIC IND CO LTD [000582] (A Japanese Company
or Corporation), JP (Japan)
APPL. NO.: 07-301797 [JP 95301797]
FILED: November 20, 1995 (19951120)
INTL CLASS: [6] G06F-015/18; **G06F-009/44**
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications);
45.1 (INFORMATION **PROCESSING** -- Arithmetic Sequence Units)

ABSTRACT

PROBLEM TO BE SOLVED: To provide a control method/device which can effectively control an equipment to be optimum to user by applying an interactive **genetic algorithm** to such problem that can be evaluated only by the human sensitivity or subjective sense of value.

SOLUTION: At the starting time point, the information shown by the solution vectors are displayed at an information display part and also the information that facilitate the comparison/evaluation among plural pieces of information shown simultaneously are displayed at an auxiliary information display part. Based on these information, each solution vector is evaluated by a user. A model estimation execution part generates an evaluation model of a control **process** based on the evaluation history of the user. Then, the solution vector is evaluated at a model evaluation calculation part based on the evaluation model. A recombination operating part 108 carries out the arithmetic operation **processing** based on the fitness that is calculated at a fitness calculation part 105 based on the evaluation carried out by the user or the model. These **processing** operations are repeated to attain the optimum control of the solution vectors.

OPTIMIZATION CONTROL METHOD AND DEVICE THEREFOR

INTL CLASS: G06F-015/18; **G06F-009/44**
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- ...
...Computer Applications); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

... which can effectively control an equipment to be optimum to user by applying an interactive **genetic algorithm** to such problem that can be evaluated only by the human sensitivity or subjective sense...

... by a user. A model estimation execution part generates an evaluation model of a control **process** based on the evaluation history of the user. Then, the solution vector is evaluated at...

... based on the evaluation model. A recombination operating part 108 carries out the arithmetic operation **processing** based on the fitness that is calculated at a fitness calculation part 105 based on the evaluation carried out by the user or the model. These **processing** operations are repeated to attain the optimum control of the solution vectors.

19/5,K/4

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05359383 **Image available**

OPTIMIZATION PROBLEM SOLVING METHOD AND OPTIMIZATION DEVICE

PUB. NO.: 08-314883 [JP 8314883 A]
PUBLISHED: November 29, 1996 (19961129)
INVENTOR(s): OKADA HIROYUKI
APPLICANT(s): FUJITSU LTD [000522] (A Japanese Company or Corporation), JP
(Japan)
APPL. NO.: 07-114198 [JP 95114198]
FILED: May 12, 1995 (19950512)
INTL CLASS: [6] G06F-015/18; **G06F-009/44**
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications);
45.1 (INFORMATION **PROCESSING** -- Arithmetic Sequence Units)

ABSTRACT

PURPOSE: To provide an **optimization** problem solving **method** and an **optimization** device capable of shortening the calculating time for finding a practical solution through the use of a **genetic algorithm**.

CONSTITUTION: When a problem 1 of optimization is given, an optimizing article and a restraint condition are converted into the chromosome 2 to be used in a **genetic algorithm** 3. Next, the search of an optimum solution is performed by a geographical isolation model 3a and/or an environmental variation model 3b. In the geographical isolation model 3a, the whole group is divided into plural slave groups A, B,... and the **genetic algorithm** is applied to each slave group. The exchange of chromosome is permitted among slave groups and the excellent solution generated in a certain slave group can be effectively utilized for even other slave groups. In the environmental variation model 3a, a genetic operation is repeated till the solution satisfying a condition can be obtained while varying some or all of the parameters of the scaling of adaptability, selection technique and cross technique, etc., to find an optimal solution.

OPTIMIZATION PROBLEM SOLVING METHOD AND OPTIMIZATION DEVICE

INTL CLASS: G06F-015/18; **G06F-009/44**
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- ...

...Computer Applications); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

PURPOSE: To provide an **optimization** problem solving **method** and an **optimization** device capable of shortening the calculating time for finding a practical solution through the use of a **genetic algorithm**.

...

...and a restraint condition are converted into the chromosome 2 to be used in a **genetic algorithm** 3. Next, the search of an optimum solution is performed by a geographical isolation model...

... model 3a, the whole group is divided into plural slave groups A, B,... and the **genetic algorithm** is applied to each slave group. The exchange of chromosome is permitted among slave groups

19/5,K/5

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04927320 **Image available**

PROCESSING METHOD AND DEVICE FOR SOLVING OPTIMIZATION PROBLEM

PUB. NO.: 07-219920 [JP 7219920 A]
PUBLISHED: August 18, 1995 (19950818)
INVENTOR(s): KUNIMOTO MAMORU
APPLICANT(s): NIPPON STEEL CORP [000665] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 06-009036 [JP 949036]
FILED: January 31, 1994 (19940131)
INTL CLASS: [6] G06F-015/18; G05B-013/02; **G06F-009/44** ; G06F-017/00; G06F-017/60
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications); 22.3 (MACHINERY -- Control & Regulation); 45.1 (INFORMATION **PROCESSING** -- Arithmetic Sequence Units)

ABSTRACT

PURPOSE: To quickly detect all solutions by detecting a part of the solutions by decision theoretic technique and applying genetic algorithm to a solution space excluding the detected solution to detect the remaining solutions.

CONSTITUTION: A planning engine part 11 prepares a vehicle allocation plan by solving an optimization problem. Namely an **AI processing** part 21 searches a part of solutions by a method using **artificial intelligence** to be one of decision theoretic means and determines the searched solution as a part of the vehicle allocation plan. A **GA processing** part 22 searches remaining solutions to be objects (solution space) excluding the solution searched by the **processing** of the **AI processing** part 21 based upon the genetic algorithm. Since the solution detected by the decision theoretic means is excluded, a searching range is reduced. Since search based upon the decision theoretic technique is limited only to a part to be easily detected, much time is not required for the search, so that total time to be required for detecting the whole solutions can be shortened.

PROCESSING METHOD AND DEVICE FOR SOLVING OPTIMIZATION PROBLEM

INTL CLASS: G06F-015/18; G05B-013/02; **G06F-009/44** ; G06F-017/00; G06F-017/60
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- ...

...Control & Regulation); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

... engine part 11 prepares a vehicle allocation plan by solving an optimization problem. Namely an **AI processing** part 21 searches a part of solutions by a method using **artificial intelligence** to be one of decision theoretic means and determines the searched solution as a part of the vehicle allocation plan. A **GA processing** part 22 searches remaining solutions to be objects (solution space) excluding the solution searched by the **processing** of the **AI processing** part 21 based upon the genetic algorithm. Since the solution detected by the decision theoretic...

19/5,K/6

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04889701 **Image available**

METHOD AND DEVICE FOR **PROCESS** CONTROL

PUB. NO.: 07-182301 [JP 7182301 A]

PUBLISHED: July 21, 1995 (19950721)

INVENTOR(s): INOUE HARUKI
KIZAWA HITOSHI
NAKAMURA KENICHI
MIZUTANI MAYUMI
YAHIRO MASAKAZU
ABE NOBORU
SATO YOSHIYUKI
KAKEGAWA MAKOTO

APPLICANT(s): HITACHI LTD [000510] (A Japanese Company or Corporation), JP
(Japan)

HITACHI ENG CO LTD [323361] (A Japanese Company or
Corporation), JP (Japan)

APPL. NO.: 05-345157 [JP 93345157]

FILED: December 21, 1993 (19931221)

INTL CLASS: [6] G06F-015/18; G05B-013/02; **G06F-009/44**

JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications);
22.3 (MACHINERY -- Control & Regulation); 45.1 (INFORMATION
PROCESSING -- Arithmetic Sequence Units)

ABSTRACT

PURPOSE: To make operation plans, which optimize control object item values, among operation plans of a control effect unit whose combinations are enormous in number in an extremely short time without decreasing precision.

CONSTITUTION: The device is equipped with a genetic optimizing means 7 which performs wide-range optimization and a neural optimizing means 8 which performs sequential comparison type optimization, and previously makes operation plan candidates for operating plural different kind of control effect units b efficiently, W according to the purposes of control by a wide-range **optimizing method** represented by a **genetic algorithm** method, determines optimum plan by making the most use of a neural sequential comparison type **optimizing method** this time for the operation plan candidates, and employs the optimum operation plans in sequence to place the respective control effect units in operation.

METHOD AND DEVICE FOR **PROCESS** CONTROL

INTL CLASS: G06F-015/18; G05B-013/02; **G06F-009/44**

JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- ...

...Control & Regulation); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

... effect units b efficiently, W according to the purposes of control by a wide-range **optimizing method** represented by a **genetic algorithm** method, determines optimum plan by making the most use of a neural sequential comparison type **optimizing method** this time for the operation plan candidates, and employs the optimum operation plans in sequence...

19/5,K/7

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04751919 **Image available**

GENETIC ALGORITHM MOUNTING METHOD AND NETWORK OPTIMIZING METHOD
USING THE SAME

PUB. NO.: 07-044519 [JP 7044519 A]

PUBLISHED: February 14, 1995 (19950214)

INVENTOR(s): MATSUMOTO KEINOSUKE

KITAYAMA TADASHI

APPLICANT(s): MITSUBISHI ELECTRIC CORP [000601] (A Japanese Company or Corporation), JP (Japan)

APPL. NO.: 05-192564 [JP 93192564]

FILED: August 03, 1993 (19930803)

INTL CLASS: [6] G06F-015/18; **G06F-009/44**

JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications);

45.1 (INFORMATION **PROCESSING** -- Arithmetic Sequence Units)

ABSTRACT

PURPOSE: To make the generation of the software efficient for application of a **genetic algorithm** and optimization of a network.

CONSTITUTION: A general-purpose model 11 of a **genetic algorithm** built up by adopting an object orientation design is combined with models 31-34 of an application object, and the **genetic algorithm** is layered by a gene template class not including data of the application object and a gene class including the data to manage the interface of both the models in the lump thereby enhancing the independency, and flexible modeling of networks 35-39 such as a distribution system, water supply pipes, a communication network and a road network and the model is flexibly revised and the optimization of the network and the retrieval of a radial network are attained by providing a model of the application object and an evaluation **function** of the **optimization**.

GENETIC ALGORITHM MOUNTING METHOD AND NETWORK OPTIMIZING METHOD
USING THE SAME

INTL CLASS: G06F-015/18; **G06F-009/44**

JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- ...

...Computer Applications); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

PURPOSE: To make the generation of the software efficient for application of a **genetic algorithm** and optimization of a network...

...CONSTITUTION: A general-purpose model 11 of a **genetic algorithm** built up by adopting an object orientation design is combined with models 31-34 of an application object, and the **genetic algorithm** is layered by a gene template class not including data of the application object and...

... radial network are attained by providing a model of the application object and an evaluation **function** of the **optimization**.

19/5,K/8

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04708049 **Image available**

SYSTEM AND DEVICE FOR AUTOMATIC GENERATION OF FUZZY INFERENCE RULE

PUB. NO.: 07-028649 [JP 7028649 A]

PUBLISHED: January 31, 1995 (19950131)

INVENTOR(s): OGAWA TOSHIYUKI

APPLICANT(s): TOYO ELECTRIC MFG CO LTD [000311] (A Japanese Company or Corporation), JP (Japan)

APPL. NO.: 05-193985 [JP 93193985]

FILED: July 09, 1993 (19930709)

INTL CLASS: [6] G06F-009/44 ; G06F-015/18

JAPIO CLASS: 45.1 (INFORMATION PROCESSING -- Arithmetic Sequence Units);

45.4 (INFORMATION PROCESSING -- Computer Applications)

ABSTRACT

PURPOSE: To efficiently adjust parameters by using a system by **genetic algorithm** in a 1st stage and a nonlinear **optimizing method** system such as a **method** of the steepest descent in a 2nd stage.

CONSTITUTION: Once various set values such as learning data are inputted to an input device 5 in the automatic fuzzy inference rule generating device 11, the inputted values are passed through an input control part 3 and the respective data are stored in a working memory 2. The respective input values, on the other hand, are inputted to an automatic fuzzy inference rule generation part 1 and the parameters, etc., of the membership function of a fuzzy inference rule are adjusted on the basis of the learning data and various set values in the working memory 2. In this case, the parameters are adjusted in the 1st stage by the system of the **genetic algorithm** and further adjusted in the following 2nd stage by the nonlinear **optimizing method** such as the **method** of the steepest descent, a conjugate gradient method, and a semi-Newton method on the basis of the parameters obtained in the 1st stage.

INTL CLASS: G06F-009/44 ; G06F-015/18

JAPIO CLASS: 45.1 (INFORMATION PROCESSING -- ...

...Arithmetic Sequence Units); 45.4 (INFORMATION PROCESSING --

ABSTRACT

PURPOSE: To efficiently adjust parameters by using a system by **genetic algorithm** in a 1st stage and a nonlinear **optimizing method** system such as a **method** of the steepest descent in a 2nd stage...

...this case, the parameters are adjusted in the 1st stage by the system of the **genetic algorithm** and further adjusted in the following 2nd stage by the nonlinear **optimizing method** such as the **method** of the steepest descent, a conjugate gradient method, and a semi-Newton method on the...

19/5,K/9

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04602450 **Image available**

COMPILER DEVICE

PUB. NO.: 06-274350 [JP 6274350 A]
PUBLISHED: September 30, 1994 (19940930)
INVENTOR(s): SHIBUYA TOSHIYUKI
APPLICANT(s): FUJITSU LTD [000522] (A Japanese Company or Corporation), JP
(Japan)
APPL. NO.: 05-060725 [JP 9360725]
FILED: March 19, 1993 (19930319)
INTL CLASS: [5] **G06F-009/45** ; G06F-015/18
JAPIO CLASS: 45.1 (INFORMATION **PROCESSING** -- Arithmetic Sequence Units);
45.4 (INFORMATION **PROCESSING** -- Computer Applications)
JOURNAL: Section: P, Section No. 1851, Vol. 18, No. 690, Pg. 13,
December 26, 1994 (19941226)

ABSTRACT

PURPOSE: To automatize the selection of option for **optimizing** a target **program** at the time of compiling on the compiling **processing** of the program in a computer.

CONSTITUTION: A group generation part 1 executes encoding as chromosomes having gene locus corresponding to designated items and generates the codes of the prescribed number of chromosomes as the group of a **genetic algorithm**. A decoding part 2 sequentially decodes the codes of the respective chromosomes in the group into the designated items. A translation part 3 translates a prescribed source program in accordance with the decoded designated items for the respective chromosomes and generates the target program. An evaluation part 4 generates a prescribed evaluation value based on the normality of a translation **processing** result for the respective chromosomes and the size/ execution situation of the target program. A genetic operation part 5 operates the **genetic algorithm** and updates the group based on the evaluation value corresponding to the respective chromosomes of the group as against the group and transfers an updated result to the decoding part 2.

INTL CLASS: **G06F-009/45** ; G06F-015/18
JAPIO CLASS: 45.1 (INFORMATION **PROCESSING** -- ...

...Arithmetic Sequence Units); 45.4 (INFORMATION **PROCESSING** --

ABSTRACT

PURPOSE: To automatize the selection of option for **optimizing** a target **program** at the time of compiling on the compiling **processing** of the program in a computer...

... and generates the codes of the prescribed number of chromosomes as the group of a **genetic algorithm**. A decoding part 2 sequentially decodes the codes of the respective chromosomes in the group...

... evaluation part 4 generates a prescribed evaluation value based on the normality of a translation **processing** result for the respective chromosomes and the size/ execution situation of the target program. A genetic operation part 5 operates the **genetic algorithm** and updates the group based on the evaluation value corresponding to the respective chromosomes of...

19/5,K/10

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04274405 **Image available**

DESIGN ASSISTING DEVICE

PUB. NO.: 05-266105 [JP 5266105 A]
PUBLISHED: October 15, 1993 (19931015)
INVENTOR(s): HIRASHIMA YASUHIKO
APPLICANT(s): MITSUBISHI ELECTRIC CORP [000601] (A Japanese Company or Corporation), JP (Japan)
APPL. NO.: 04-063325 [JP 9263325]
FILED: March 19, 1992 (19920319)
INTL CLASS: [5] G06F-015/60; **G06F-009/06**
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** -- Computer Applications); 34.1 (SPACE DEVELOPMENT -- Spacecraft); 45.1 (INFORMATION **PROCESSING** -- Arithmetic Sequence Units)
JAPIO KEYWORD: R060 (MACHINERY -- Automatic Design)
JOURNAL: Section: P, Section No. 1680, Vol. 18, No. 42, Pg. 34, January 21, 1994 (19940121)

ABSTRACT

PURPOSE: To enable even a designer who have poor experience to easily design a control system and even a designer who have rich experience to design a control system with high performances by using the algorithm of a **neural network**.

CONSTITUTION: A **neural network** device 4 is connected to a design data **processor** 1 and a correction plan display means 5 retrieves whether or not there is a similar past correction in a correction knowledge storage means 6 unless the performance of design data obtained from a design data analyzing means 3 satisfy design request specifications 9 and displays the retrieval result to the designer 8. The correction of design data in executed again by a design data plotting means 2 based on the obtained correction plan plotting. When the designer 8 makes a correction which is not present in the storage means 6, it is held as new knowledge. An **optimizing method** generating means 7 repeatedly generates an **optimizing method** from the design request specifications 9 and sends it to the design data analyzing means 3 so that the design data satisfy the set request specifications 9.

INTL CLASS: G06F-015/60; **G06F-009/06**
JAPIO CLASS: 45.4 (INFORMATION **PROCESSING** --

...Spacecraft); 45.1 (INFORMATION **PROCESSING** --

ABSTRACT

... experience to design a control system with high performances by using the algorithm of a **neural network**.

...

...CONSTITUTION: A **neural network** device 4 is connected to a design data **processor** 1 and a correction plan display means 5 retrieves whether or not there is a...

...is not present in the storage means 6, it is held as new knowledge. An **optimizing method** generating means 7 repeatedly generates an **optimizing method** from the design request specifications 9 and sends it to the design data analyzing means

| Set | Items | Description |
|------|--|--|
| S1 | 887051 | ARTIFICIAL () INTELLIGENCE OR AI OR MACHINE () LEARN? OR - GENETIC () ALGORITHM? ? OR NEURAL()NETWORK? |
| S2 | 414101 | CALL OR CALLS |
| S3 | 1436 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) S2 |
| S4 | 310500 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) (METHO- D? ? OR FUNCTION? ? OR ROUTINE? ? OR AGENT? ? OR MODULE? ? OR PROGRAM? ? OR SUBROUTINE? ?) |
| S5 | 447 | (OPTIMI?E? ? OR OPTIMI?ATION? ? OR OPTIMI?ING) (5N) (REQUE- ST? ? OR REQUESTING) |
| S6 | 59604 | PREPROCESS? OR PRE()PROCESS? |
| S7 | 36303 | PROXY OR PROXIES |
| S8 | 109 | S3 AND S1 |
| S9 | 0 | S8 AND S6 |
| S10 | 10 | S8 AND (REMOTE OR REMOTELY OR PORTABLE? ? OR MOBILE? ?) |
| S11 | 5 | S10 NOT PY>2001 |
| S12 | 4 | RD (unique items) |
| S13 | 0 | S8 AND S7 |
| S14 | 358 | S4 AND S2 AND S1 |
| S15 | 3 | S14 AND S6 |
| S16 | 3 | S15 NOT S12 |
| S17 | 1 | S16 NOT PY>2001 |
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| File | 62: SPIN(R) | 1975-2006/Sep W3 (c) 2006 American Institute of Physics |
| File | 99: Wilson Appl. Sci & Tech Abs | 1983-2006/Jul (c) 2006 The HW Wilson Co. |
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05922809 E.I. No: EIP01385582029

Title: Near optimal call admission control with genetic algorithm for multimedia services in wireless/ mobile networks

Author: Xiao, Yang; Chen, C.L.Philip; Wang, Yan

Corporate Source: Wright State Univ, Dayton, OH, United States

Conference Title: IEEE 2000 National Aerospace and Electronics Conference (NAECON 2000)

Conference Location: Dayton, OH, USA Conference Date: 20001010-20001012

E.I. Conference No.: 57946

Source: National Aerospace and Electronics Conference, Proceedings of the IEEE v 1 2000.

Publication Year: 2000

CODEN: NASEA9

Language: English

Document Type: CA; (Conference Article) Treatment: T; (Theoretical)

Journal Announcement: 0110W4

Abstract: In this paper, we treat a cell as a M/M/C/C queuing system with m class users. Semi-Markov Decision Process (SMDP) can be used to provide an optimal **Call Admission Control (CAC)**. The **optimization** is in the sense of optimizing the channel utilization for service providers and satisfying the Quality of Service (QoS) requirements for service users, which are the upper bounds of handoff blocking probabilities. However, such method fails when the state space and the action space are too large. We apply **genetic algorithm** approach to address such problems where the SMDP approach fails. We code the call admission control decisions as binary strings, where the value of '1' in the position i of the string stands for the decision of accepting a call in class-i; whereas, the value of '0' in the position i of the string stands for the decision of rejecting a call in class-i. The resulting binary strings from the **genetic algorithm** are the near optimal CAC decisions. Simulation results from the **genetic algorithm** are compared with the optimal solution obtained from linear programming for SMDP. The results reveal that the **genetic algorithm** approximates the optimal solution very well. (Author abstract) 20 Refs.

Descriptors: *Wireless telecommunication systems; **Mobile** telecommunication systems; **Genetic algorithms**; Multimedia systems; Telecommunication services; Queueing networks; Markov processes; Decision theory; Probability; Linear programming

Identifiers: Call admission control; Semi-Markov decision process (SMDP); Quality of service

Classification Codes:

723.5 (Computer Applications); 922.1 (Probability Theory); 921.5 (Optimization Techniques)

716 (Electronic Equipment, Radar, Radio & Television); 717 (Electro-Optical Communication); 921 (Applied Mathematics); 723 (Computer Software, Data Handling & Applications); 922 (Statistical Methods)

71 (ELECTRONICS & COMMUNICATION ENGINEERING); 92 (ENGINEERING MATHEMATICS); 72 (COMPUTERS & DATA PROCESSING)

12/5/3 (Item 1 from file: 34)
DIALOG(R)File 34:SciSearch(R) Cited Ref Sci
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09299585 Genuine Article#: 389UY Number of References: 33
Title: A Hopfield neural - network -based dynamic channel allocation with handoff channel reservation control

Author(s): Lazaro O (REPRINT) ; Girma D
Corporate Source: Univ Strathclyde, Mobile Grp, Commun Div, Dept Elect & Elect Engn, Glasgow G1 1XW/Lanark/Scotland/ (REPRINT); Univ Strathclyde, Mobile Grp, Commun Div, Dept Elect & Elect Engn, Glasgow G1 1XW/Lanark/Scotland/

Journal: IEEE TRANSACTIONS ON VEHICULAR TECHNOLOGY, 2000, V49, N5 (SEP), P 1578-1587

ISSN: 0018-9545 Publication date: 20000900

Publisher: IEEE-INST ELECTRICAL ELECTRONICS ENGINEERS INC, 345 E 47TH ST, NEW YORK, NY 10017-2394 USA

Language: English Document Type: ARTICLE

Geographic Location: Scotland

Journal Subject Category: ENGINEERING, ELECTRICAL & ELECTRONIC; TELECOMMUNICATIONS; TRANSPORTATION SCIENCE & TECHNOLOGY

Abstract: As channel allocation schemes become more complex and computationally demanding in cellular radio networks, alternative computational models that provide the means for faster processing time are becoming the topic of research interest. These computational models include knowledge-based algorithms, **neural networks**, and stochastic search techniques. This paper is concerned with the application of a Hopfield **neural network** (HNN) to dynamic channel allocation (DCA) and extends previous work that reports the performance of HNN in terms of new call blocking probability. In this paper, we further model and examine the effect on performance of traffic mobility and the consequent intercell call handoff, which, under increasing load, can force call terminations with an adverse impact on the quality of service (QoS). To maintain the overall QoS, it is important that forced call terminations be kept to a minimum. For an HNN-based DCA, we have therefore modified the underlying model by formulating a new energy function to account for the overall channel allocation **optimization**, not only for new **calls** but also for handoff channel allocation resulting from traffic mobility. That is, both new-call blocking and handoff-call blocking probabilities are applied as a joint performance estimator. We refer to the enhanced model as HNN-DCA++, We have also considered a variation of the original technique based on a simple handoff priority scheme, here referred to as HNN-DCA+. The two neural DCA schemes together with the original model are evaluated under traffic mobility and their performance compared in terms of new-call blocking and handoff-call dropping probabilities. Results show that the HNN-DCA++ model performs favorably due to its embedded control for assisting handoff channel allocation.

Descriptors--Author Keywords: dynamic channel allocation (DCA) ; handoff channel reservation ; Hopfield **neural network** (HNN)

Identifiers--KeyWord Plus(R): **MOBILE** COMMUNICATION-SYSTEMS; RADIO TELEPHONE SYSTEMS; PERFORMANCE ANALYSIS; CELLULAR NETWORKS; ASSIGNMENT; ALGORITHM; DESIGN

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**Title: ATM NETWORK DESIGN AND OPTIMIZATION - A MULTIRATE LOSS NETWORK
FRAMEWORK**

Author(s): MITRA D; MORRISON JA; RAMAKRISHNAN KG
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Abstract: Asynchronous transfer mode (ATM) network design and **optimization**
at the **call**-level may be formulated in the framework of multirate,
circuit-switched, loss networks with effective bandwidth encapsulating
cell-level behavior. Each service supported on the ATM network is
characterized by a rate or bandwidth requirement. Future networks will
be characterized by links with very large capacities in circuits and by
many rates. Various asymptotic results are given to reduce the
attendant complexity of numerical calculations. A central element is a
uniform asymptotic approximation (UAA) for link analyses. Moreover, a
unified hybrid approach is given which allows asymptotic and
nonasymptotic methods of calculations to be used cooperatively. Network
loss probabilities are obtained by solving fixed-point equations. A
canonical problem of route and logical network design is considered. An
optimization procedure is proposed, which is guided by gradients
obtained by solving a system of equations for implied costs. A novel
application of the EM algorithm gives an efficient technique for
calculating implied costs with changing traffic conditions. Finally, we
report numerical results obtained by the software package TALISMAN,
which incorporates the theoretical results. The network considered has
eight nodes, 20 links, six services; and as many as 160 routes.

Descriptors--Author Keywords: EFFECTIVE BANDWIDTH ; ASYMPTOTIC
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Research Fronts: 94-5303 002 (CELLULAR **MOBILE** SYSTEMS; DYNAMIC CHANNEL
ASSIGNMENT; CALL BLOCKING PERFORMANCE; CIRCUIT-SWITCHED NETWORKS)

94-0946 001 (NORMAL INCOMPLETE DATA; FINITE MIXTURE MODEL; EM
ALGORITHM; MISSING VALUES; MOMENT ESTIMATORS; **NEURAL NETWORKS**)

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Title: Image segmentation using Markov random field model in fully parallel cellular network architectures

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THEORY & METHODS

Abstract: Markovian approaches to early vision processes need a huge amount of computing power. These algorithms **call** usually be implemented on parallel computing structures. Herein, we show that the Markovian labeling approach can be implemented in fully parallel cellular network architectures, using simple functions and data representations. This makes possible to implement our model in parallel imaging VLSI chips.

As an example, we have developed a simplified statistical image segmentation algorithm for the Cellular Neural/Nonlinear Networks Universal Machine (CNN-UM), which is a new image processing tool, containing thousands of cells with analog dynamics, local memories and processing units. The Modified Metropolis Dynamics (MMD) **optimization method** can be implemented into the raw analog architecture of the CNN-UM. We can introduce the whole pseudo-stochastic segmentation process in the CNN architecture using 8 memories/cell. We use simple arithmetic functions (addition, multiplication), equality-test between neighboring pixels and very simple nonlinear output functions (step, jigsaw). With this architecture, the proposed VLSI CNN chip can execute a pseudo-stochastic relaxation algorithm of about 100 iterations in about 100 CLS.

In the suggested solution the segmentation is unsupervised, where a pixel-level statistical estimation model is used. We have tested different monogrid and multigrid architectures.

In our CNN-UM model several complex **preprocessing** steps can be involved, such as texture-classification or anisotropic diffusion. With these **preprocessing** steps, our fully parallel cellular system may work as a high-level image segmentation machine, using only simple functions based on the close-neighborhood of a pixel. (C) 2000 Academic Press.

Identifiers--KeyWord Plus(R): **NEURAL NETWORKS** ; EDGE-DETECTION;
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